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(71)Applicant : DAINIPPON TORYO CO LTD

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(72)Inventor : MEIKEI MITSUTOSHI
YONEMOCHI KENJI
FUJII SATOSHI

(54) IN-MOLD COATING COMPOSITION

(57)Abstract:

PURPOSE: To obtain the subject composition useful for improving qualities of appearance by covering pin holes, etc., on the surface of molded article of FRP, providing a coating film having excellent smoothness, etc., by blending a vehicle component with a specific composition with chlorinated polypropylene.

CONSTITUTION: 100 pts.wt. vehicle component comprising (A) 20-70wt.% oligomer containing two or more (meth)acrylates, its resin or unsaturated polyester resin and (B) 80-30wt.% copolymerizable ethylenic unsaturated monomer (e.g. styrene) is blended with (C) 1-50 pts.wt. chlorinated polypropylene having 10-50wt.% chlorine content to give the objective composition. For example, epoxy (meth) acrylate obtained by subjecting a bisphenol A type epoxy compound and an unsaturated carboxylic acid such as (meth)acrylic acid to ring-opening addition reaction in the ratio of 0.5-1.5 carboxyl group equivalent based on 1 equivalent epoxy group is used as the (meth)acrylate-containing oligomer.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention covers the defect of the pinhole produced on the front face of a fiber-reinforced-plastics moldings, a fiber pattern, etc., and relates to the coat constituent in a mold which can form the smooth coat which improves appearance quality.

[0002]

[A Prior art and its technical problem which should be solved] The moldings obtained from fiber-reinforced-plastics molding materials, such as the glass fiber and carbon fiber which make a matrix thermosetting resin or thermoplastics, such as a sheet molding compound (SMC), a bulk molding compound (BMC), and a stampable sheet, organic fiber, and mineral fiber, is excellent in a mechanical strength, a moldability, etc., and since it is lightweight, it is widely used for the field of the case of an electrical machinery and apparatus, an automobile shell plate, housing equipment components, etc. as an ingredient which replaces a metal. However, these moldings had the surface discontinuity of a pinhole, kennel, minute crack, and fiber pattern etc., and gloss was also low, and was bad, and weatherability, a water resisting property, its chemical resistance, etc. were still worse, and they had the trouble that a surface degree of hardness was also low. [of appearance quality] Therefore, although these moldings are usually painted and the protective coating is made to form in a front face Since the moldings has much surface discontinuity, even if it paints it with the usual paint means, such as a spray, as above-mentioned By being hard to form the coat excellent in appearances, such as smooth nature, when it applied to the moldings which adhesion is also low and makes thermoplastics a matrix further, it was easy to produce a solvent crack with the organic solvent in a coating, and there was a trouble that paint workability was also bad. Therefore, the coat approach in a mold is proposed as an approach of solving these troubles. U.S. Pat. No. 3184527 and 4076788 A number and 4668460 Number etc. -- it is the approach currently indicated. [for example,]

[0003] However, since this coat approach in a mold was a special approach, it was difficult the approach to use the conventional coating as it is. Therefore, the coat constituent in a mold suitable for the coat approach in a mold is developed in recent years. For example, it is the coat constituent in a mold currently indicated by JP,54-13273,B, JP,59-15137,B, JP,59-19583,B, etc. Although these coat constituents in a mold covered the surface discontinuity of a moldings and paint workability was also good, there was a trouble that the smooth nature of the coat obtained was especially inadequate, and adhesion was inferior to the fiber-reinforced-plastics moldings which makes thermoplastics a matrix. this invention persons result in a header and this invention the coat constituent in a mold which can form the coat excellent in smooth nature, adhesion, etc., employing efficiently the point which was excellent in the conventional coat constituent in a mold, as a result of inquiring wholeheartedly in view of such the actual condition.

[0004]

[Means for Solving the Problem] That is, this invention is (i). Vehicle component 100 which serves as the oligomer which has at least two or more acrylate (meta) radicals, its resin, or 20 - 70 % of the weight

of unsaturated polyester resins from 80 - 30 % of the weight of copolymerizable ethylene nature partial saturation monomers The coat constituent in a mold with which the chlorination polypropylene 1 whose (ii) chlorine content is 10 - 50 % of the weight - 50 weight sections were made to blend is offered to the weight section. Hereafter, this invention is explained.

[0005] The coat constituent in a mold used by this invention is a vehicle component (i) which consists of the oligomer which has at least two or more acrylate (meta) radicals, its resin or an unsaturated polyester resin, and an ethylene nature partial saturation monomer. Chlorination polypropylene (ii) and the pigment (iii) usually used, a polymerization initiator (iv), and release agent (v) It consists of refining resin, various additives, etc. which were added if needed further. Vehicle component (i) Specifically as the oligomer which has said at least two or more acrylate (meta) radicals to constitute, or its resin, the oligomer or liquefied resin usually used as a vehicle component of coat constituents in a mold, such as epoxy (meta) acrylate, urethane (meta) acrylate, polyester (meta) acrylate, polyether (meta) acrylate, or two or more sorts of such mixture, can be mentioned.

[0006] Although these oligomer or its resin changes with classes, respectively, it is desirable to set weight average molecular weight to about 300-10,000 generally. Moreover, as for oligomer or its resin, it is desirable to have preferably at least two or more acrylate (meta) radicals [2-4] per oligomer or the resin 1 molecule. Hereafter, the oligomer of this invention or its resin is explained concretely. Said epoxy acrylate compound is per 1Eq of epoxy groups, and the carboxyl group equivalent 0.5-1.5 about an epoxy compound and unsaturated carboxylic acid. It is the compound which used at a rate which becomes and was manufactured according to the ring-opening addition reaction of the acid to the usual epoxy group. As said unsaturated carboxylic acid, an acrylic acid and a methacrylic acid can be mentioned as a typical thing, and bisphenol A mold epoxy, phenolic novolak mold epoxy, etc. can be mentioned as a typical thing as an epoxy compound.

[0007] Said urethane (meta) acrylate compound The organic diol and hydroxyalkyl (meta) acrylate which have organic diisocyanate and a hydroxyl group at a rate from which the ratio of NCO/OH is set to 0.9-1.0 Manufacture by the usual approach, for example, an isocyanate end polyurethane prepolymer is made to generate by organic diisocyanate and organic diol under existence of urethane-ized catalysts, such as a dibutyl tin JIRAU rate. Subsequently, it can manufacture by making hydroxyalkyl (meta) acrylate react until almost all the isolation isocyanate radical reacts. In addition, about 0.1-0.5 mols of former are suitable for the rate of organic diol and hydroxyalkyl (meta) acrylate to one mol of latters. In addition, although the organic diisocyanate currently used for usual coatings, such as toluene diisocyanate, isophorone diisocyanate, and polymethylene polyphenyl diisocyanate, as said organic diisocyanate can be used, the mixture of 2 of toluene diisocyanate, 4- and 2, and 6-isomer is especially useful.

[0008] As said organic diol, the diester diol which is alkylene diols, such as ethylene glycol, propylene glycol, a diethylene glycol, a polyethylene glycol, and a polypropylene glycol, dicarboxylic acid, or the diester resultant of the anhydride can mention as a typical thing. As said hydroxyalkyl (meta) acrylate, the compound shown by general formula $\text{CH}_2=\text{CRCO}_2-(\text{C}_n\text{H}_{2n})-\text{OH}$ (however, R - H or CH_3 , and n positive number of 2-8) is useful. Said polyester acrylate is the compound made to manufacture by the reaction of the polyester polyol which has a hydroxyl group at the end, and the above-mentioned unsaturated carboxylic acid. In addition, typically, said polyester polyol carries out the esterification reaction of the dicarboxylic acid of saturation or partial saturation, or its acid anhydride and alkylene diol of an excessive amount, and is obtained. As said dicarboxylic acid, ethylene glycol, propylene glycol, butanediol, pentanediol, etc. can mention oxalic acid, a succinic acid, an adipic acid, a phthalic-acid maleic acid, etc. as a typical thing as said alkylene diol.

[0009] Moreover, said polyether acrylate is the compound made to manufacture by the reaction of polyether polyols, such as a polyethylene glycol and a polypropylene glycol, and the above-mentioned unsaturated carboxylic acid. the weight average molecular weight of these oligomer or the resin of those -- about 300-10,000 -- desirable -- 500-5,000 It is suitable. Vehicle component (i) Said unsaturated polyester resin to constitute can use what is usually used as a vehicle component of the coat constituent in a mold, makes organic polyol and partial saturation polycarboxylic acid react by the well-known

approach, makes saturation polycarboxylic acid react if needed further, and is manufactured. In addition, as said organic polyol, it can mention as what has ethylene glycol, propylene glycol, triethylene glycol, trimethylol propane, a glycerol, typical bisphenol A, typical Bisphenol S, etc., and maleate (anhydrous), a fumaric acid, an itaconic acid (anhydrous), etc. can be mentioned as a typical thing as said partial saturation polycarboxylic acid. the average molecular weight of an unsaturated polyester resin -- about 800-10,000 -- desirable -- 1,000-4,000 It is suitable.

[0010] It is also possible to use together the oligomer which has these (meta) acrylate radical, or its resin and unsaturated polyester resin. Vehicle component (i) As said ethylene nature partial saturation monomer to constitute, although styrene, alpha methyl styrene, KURORU styrene, vinyltoluene, a divinylbenzene, methyl (meta) acrylate, ethyl (meta) acrylate, propyl (meta) acrylate, ethylene glycol (meta) acrylate, TORIMECHI roll pro pantry (meta) acrylate, etc. can be mentioned as a typical thing, for example, it is not limited to these.

[0011] Vehicle component (i) It consists of the oligomer which has the aforementioned (meta) acrylate radical, its resin or an unsaturated polyester resin, and said ethylene nature partial saturation monomer, although that blending ratio of coal is determined as arbitration according to these classes, [weight criteria] are usually (20-70:80-30) suitable for it, and the coat constituent which has a moderate hardening property and viscosity in this range is obtained. The chlorination polypropylene (ii) used by this invention is blended in order to raise the smooth nature of a coat and adhesion which are formed in a moldings front face. in addition, the chlorination polypropylene as used in the field of this invention -- the homopolymer of a propylene, or a propylene -- about 70 -- more than mol % -- it is the polymer which made the copolymer with ethylene, a butene, etc. which are included chlorinate, and it is desirable the number average molecular weight about 5,000-50,000 and to be especially referred to as 10,000-40,000. Thus, it is 5,000 to specify number average molecular weight. When it is in the inclination for smooth nature to fall that it is the following and 50,000 is exceeded on the other hand, it is said BIHIKURI component (i). It is because it is in the inclination for compatibility to fall. Moreover, 20 - 45 % of the weight is preferably suitable for the chlorine content of chlorination polypropylene (ii) ten to 50% of the weight. Since the adhesion of a coat will fall if a chlorine content is larger than said range, the storage stability of a coat constituent will worsen if conversely small, and a smooth coat becomes is hard to be obtained, neither is desirable. The loadings of chlorination polypropylene are said vehicle component (i). 100 1 - 50 weight section and the coat which 2 - 30 weight section is preferably suitable, is this range, and was excellent in smooth nature, adhesion, etc. are obtained to the weight section. In addition, since adhesion, weatherability, etc. will fall if it becomes superfluous, it is not desirable.

[0012] Pigment used by this invention (iii) If it carries out, the various color pigments and extender which are usually used as the object for plastics and an object for coatings from the former can be used. In the typical thing which can be concretely mentioned as a color pigment a white system -- titanium oxide; -- a yellow system -- the benzidine yellow, titanellow, and Hansa Yellow; sour orange system -- a molybdate orange -- With reddish, by Quinacridone and the MARUN; green system, The chrome yellow, benzine Orange; Chrome green, Chromium oxide Green; in a blue system, there are scale-like pigments, such as a mica processed with powdered pigments, such as carbon black and an iron oxide, or a flake-like iron oxide, nickel, aluminum, graphite, titanium oxide, etc., by ultramarine blue, cobalt blue, and the ultra marine; black system. Moreover, as an extender, a calcium carbonate, talc, a barium sulfate, an aluminum hydroxide, a silica, clay, etc. can be mentioned as a typical thing. In addition, a pigment colors a moldings, gives a fine sight, distributes the contraction stress accompanying coat hardening, it is filled up with adhesive improvement with a base (moldings), and the kennel of a large number which exist in a moldings front face further, or it makes surface minute irregularity (way BINESU) smooth, and it blends it in order to improve the appearance on the front face of mold goods.

[0013] Therefore, the loadings of a pigment are the above (i). Component 100 It is 10-150 to the weight section. The weight section is suitable. In addition, when [which performs finishing coloring paint on the coat obtained] carrying out a case or clear finishing, it is not necessary to necessarily blend a color pigment. Moreover, the polymerization initiator (iv) used by this invention generates a free radical, and it is used for it in order to carry out the polymerization of said vehicle component. In the typical thing

which can be concretely mentioned as a polymerization initiator, it is tertiary butylperoxy benzoate, tertiary butylperoxy 2-ethylhexanoate, tertiary butylperoxyisopropyl, lauroyl peroxide, tertiary butylperoxy laurate, 1, and 1-screw (tertiary butylperoxy). - There are 3, 3, 5-trimethylcyclohexane, acetylacetone peroxide, etc.

[0014] The loadings of a polymerization initiator are described above. (i) vehicle component 100 0.2 - 10 weight section is suitable to the weight section. Although it adds in order to make a hardening coat release from mold smoothly from metal mold, the release agent (v) used by this invention can mention stearates, such as zinc, aluminum, magnesium, and calcium, lecithin, alkyl phosphate, etc. as a typical thing as the class, and describes the loadings above. (i) vehicle component 100 0.1 - 10 weight section is suitable to the weight section. The coat constituent in a mold of this invention was explained above. (i) - (v) A component is made into a constituent and it consists of what blended refining resin, such as various additives, such as a hardening accelerator, a dispersant, a sedimentation inhibitor, a floating assistant, polymerization inhibitor, and an ultraviolet ray absorbent, polymethylmethacrylate resin, saturated polyester resin, and vinyl acetate resin, a plasticizer, etc. if needed further.

[0015] Next, how to cover in a mold using the coat constituent in a mold of this invention is explained. The fiber-reinforced-plastics molding material used by this invention is well-known from the former, such as SMC, BMC, FRTP, and a stumpable sheet, and can use these without a limit especially. The above-mentioned fiber-reinforced-plastics molding material which specifically makes a matrix thermoplastics, such as thermosetting resin, such as an unsaturated-polyester-resin system, an epoxy acrylate resin system, a phenol resin system, and an epoxy resin system, or a polyolefin resin system, a polystyrene resin system, a polycarbonate resin system, a polybutyrene-terephthalate-resin system, polyester resin, and a polyphenylene oxide resin system, is mentioned as a typical thing. Although the conventional approach of fabricating within metal mold as the shaping approach can use without a limit especially, the approach of a publication is in JP,61-273921,A and JP,55-9291,B suitably. That is, when one metal mold fits in in the metal mold (the former is called "female mold" and the latter is hereafter called "punch" for convenience.) of another side, the above-mentioned fiber-reinforced-plastics molding material is paid in the metal mold which forms the mold cavity space which has the configuration of the moldings made into the object, and it fabricates within ***** and metal mold. That is, when the molding material makes thermosetting resin the matrix, it heats and pressurizes within metal mold, and while carrying out the flow of the molding material, a heat-curing reaction is carried out, and it fabricates in the target configuration. Although it is decided according to the class of cycle time and molding material etc. that it will be arbitration, 130 - 200 ** is usually suitable for whenever [shaping stoving temperature], and before paying a molding material, it is desirable to make it maintain to this temperature beforehand until the hardening coat which sets metal mold to said temperature and is mentioned later is obtained.

[0016] Although compacting pressure is determined as arbitration according to the class of molding material etc. whenever [stoving temperature], 50 - 200 kgf/cm² is usually suitable for it. When cycle time pours in the coat constituent in a mold, about 40 - 200 seconds is [that what is necessary is just to have hardened about the reinforcement whose configuration of a moldings is extent which is not a disadvantage crack] usually suitable for it, until a molding material carries out the completion of a heat-curing reaction thoroughly. When the molding material makes thermoplastics the matrix, the ingredient which carried out heating softening in heating oven etc. beforehand is pressurized within metal mold, it fabricates in the configuration aiming at a molding material and the coat constituent in a mold is poured in on the other hand, the reinforcement which is extent which the configuration of a moldings does not spoil is stiffened. Thus, although it is larger than the hardening coat thickness of the request which separates and mentions a punch later from the front face of a moldings after stiffening a moldings After giving a gap inadequate for making fitting of said metal mold break away, metal mold in the condition of having fitted in And said compacting pressure has been maintained without giving a gap. or the thickness of the request after decompressing this pressure -- desirable -- 30-1000 micrometers The coat constituent of only an amount with which a hardening coat is obtained is poured in between a punch and a moldings front face (injection impregnation).

[0017] Subsequently, it is about 20 to 150 kgf/cm² so that a coat constituent may cover a moldings front face to homogeneity and may permeate it, holding whenever [stoving temperature] to the temperature defined beforehand when the molding material makes thermosetting resin the matrix. It is usually about 20-240 until it pressurizes (**) and a hardening coat forms. Second extent maintenance is carried out. It is about 20 to 150 kgf/cm² so that a coat constituent may cover a moldings front face to homogeneity and may permeate it on the other hand, holding a die temperature to the temperature which a moldings does not re-soften and a coat constituent hardens, for example, 60 - 160 **, when the molding material makes thermoplastics the matrix. It is usually about 20-240 until it pressurizes (**) and a hardening coat forms. Second extent maintenance is carried out. In addition, since it is so desirable that the curing temperature of a coat constituent is low in this case, it is desirable to use together hardening accelerators, such as naphthenic-acid cobalt and an amine. Thus, after a hardening coat is formed in a moldings front face, the moldings which has a protective coating is obtained by taking out an aperture and a moldings for metal mold.

[0018]

[Effect of the Invention] The coat constituent in a mold of this invention can form the coat which covered the surface discontinuity of the pinhole of a fiber-reinforced-plastics moldings front face etc., and was excellent in smooth nature, adhesion, etc.

[Example] Hereafter, an example explains this invention to a detail further. In addition, the "section" and "%" are weight criteria among an example.

Kneading distribution of the component (however, a polymerization initiator is removed) shown in one to examples 1-3 and example of comparison 5 table 1 was carried out, the polymerization initiator was added just before the activity, and the coat constituent in a mold was prepared.

[0019]

[A table 1]

[Table 1]

	Fruit	**	Example	Ratio	**	Example	1	2	3	1	2	3	4	5	--
Urethane acrylate	Notes	1	36	26	36	36	36	36	36	Epoxy acrylate	Notes	2	14	9	
Unsaturated polyester	Notes	3	25	25	resin	SU	CHI	RE	N	40	5565	40	4040	40	65
hydroxypropyl	10	10	10	10	10	10	10	10	10	Methacrylate	trimethylol	propane	10	10	
polypropylene	Notes	4	15	15	0.5	60	Polypropylene	Notes	5	15	Chlorination	polypropylene	Notes	6	15
Chlorination	polypropylene	Notes	7	12	carbon black	78	87	7	7	7	8	TARU	KU	60	60
zinc stearates	0.5	0.7	0.70.5	0.5	0.5	0.5	0.78%	octylic acid	cobalt	1	2	2	1	1	1
refining	Tree	Fat	notes	8	10	10	tertiary butyl	55	3	5	5	55	3	peroxy benzoate	

[0020] notes 1) polyethylene-glycol-tolylene diisocyanate-hydroxyethyl acrylate oligomer; -- weight average molecular weight 2700 ; one -- a molecule -- per -- acrylate -- a radical -- two -- a piece -- notes -- two -- an epoxy compound -- [-- "-- Epicoat -- 828 -- " (oil-ized shell epoxy company make) --] - a methacrylic acid -- oligomer -- ; -- weight average molecular weight resultant [with the polyhydric alcohol which consists of the polybasic acid and one mol of neopentyl glycol which consists of one mol of two methacrylate radical notes 3 maleic anhydrides and one mol of isophthalic acid per 540; 1 molecule, and one mol of propylene glycols]; -- number-average-molecular-weight 1500 notes 4 chlorine content 41 % Number average molecular weight 35,000 notes 5 ** 0%, ** 30,000 notes 6 ** 60 %, ** 40,000 notes 7 ** 25 %, ** 40,000 notes 8 vinyl acetate resin [0021] Shaping equipment given in JP,61-273921,A and the moldings which has a coat according to the shaping approach were manufactured the following condition using the coat constituent in a mold obtained in examples 1-3 and the examples 1-5 of a comparison. This approach is explained below at a detail. It was set as 120 degrees C of metal mold using the plate trial metal mold which gave chrome plating of die length of 300mm, and width 300 mm. First, the thermoplastic fiberglass-reinforced-plastics ingredient sheet (40% of glass fiber contents) which makes polypropylene resin a matrix was heated to about 200 ** within heating oven, and this sheet was set on female mold and fabricated under moulding pressure 150 kgf/cm² and the conditions for [cycle time] 30 seconds. Subsequently, said each coat constituent in a mold after decompressing moulding pressure to 20 kgf/cm² 19 ml is poured in between a punch and a

moldings, 70 kgf/cm² is pressurized again, and it is 180. It held during the second. Subsequently, they are an aperture and thickness abbreviation about metal mold. 200 micrometers The coat moldings covered with the coat was taken out. About the obtained coat moldings, each trial of a coat appearance, surface roughness, adhesion, and warm water-proof nature was performed, and the result was shown in a table 2. The coat obtained in the examples 1-3 which used the coat constituent of this invention the passage clearer than a table 2 was excellent in an appearance, smooth nature, adhesion, and warm water-proof nature. The coat was selectively taken by metal mold, and a uniform coat was not obtained, but the example 1 of a comparison which used the polypropylene which has not been chlorinated on the other hand, and the example 5 of a comparison which does not blend chlorination polypropylene were what is not commodity value. Moreover, as for the example 2 of a comparison and few examples 3 of a comparison of the amount of chlorination repro pyrenes which used chlorination polypropylene with many chlorine contents, a coat appearance, adhesion, and warm water-proof nature fell. Moreover, the example 4 of a comparison with the superfluous amount of chlorination polypropylene had bad warm water-proof nature.

[0022]

[A table 2]

[Table 2]

----- A fruit ** An example ----- 1 2 3 -----
 --- ** Film Besides It sees. Note 9 ** Rank ** Rank ** Rank table Field ** Notes 10 5.4 5.6 With 6.8 It wears. **** 11 100/100 100/100 100/100 ** ** Water Sex Note 12 100/100 100/100 100/100 -----
 ----- [0023]

[Table 2] It continues. ----- A ratio ** An example ----- 1 2 3 4
 5 ----- ** Outside of the film It sees. Note 9 Rejection Rejection Rejection **
 Rank Rejection table Field ** Notes 10 - 7.6 17.1 10.6 - With Arrival nature Notes 11 -60/100 10/100
 90 / 100- ** ** Water Sex Notes 12 - 10/100 0/100 5/100 - ----- [0024] notes 9)
 To a coat moldings, it is 35**5 micrometers of desiccation thickness about 2 liquid type urethane system coating. After having sprayed so that it might become, and making it dry for 80 degree-Cx 30 minutes, the appearance was observed visually.

Acceptance: It is abnormality nothing to a coat. Rejection: They are abnormal occurrence notes 10 JIS B 0601-1982, such as a crack and a crack, to a coat. It depends. Unit: Rmax [μm]

notes 11) 2mm width grid cut cellophane tape peel test per coat moldings which was obtained with notes 9 and which carried out the top coat was performed, and the residual number of divisions was counted. In addition, neither was counted to the residual number of divisions about that in which only the thing and finishing paint film which exfoliated from the moldings base exfoliated.

notes 12) the coat moldings which was obtained with notes 9 and which carried out the top coat -- attaching -- 40-degree-C warm water -- 240 the room temperature after carrying out time amount immersion -- 1 hour -- leaving it -- Note 11 the same -- the adhesion test was carried out.

[0025] Kneading distribution of the component (however, a polymerization initiator is removed) shown in six to examples 4-6 and example of comparison 9 table 3 was carried out, the polymerization initiator was added just before the activity, and the coat constituent in a mold was prepared.

[A table 3]

[Table 3]

----- Fruit ** Example Ratio ** Example ----- 4 5 6 6 7 8 9 -----
 ----- Urethane AKUTA rate Note 1 32 50 32 32 32 32 Epoxy acrylate Notes 2 32
 30 32 32 32 32 Polyester Notes 15 30 Bitter taste relay toss CHI RE N 3030 40 30 30 30 30
 Hydroxypropyl 6 10 10 6 6 6 6 Methacrylate chlorination polypropylene Note 4 2 2 40 60
 Polypropylene Note 5 2 Chlorination polypropylene Notes 6 2 Acid -izing Chita N 20 202020 2020 20
 TA RU KU 20 20 20 20 20 20 Calcium carbonate 60 6060 60 60 60 60 Zinc stearate 0.6 1 0.6 0.6 0.6
 0.6 0.6 8% octylic acid cobalt 1 1 1 1 1 1 Acetylacetone 0.2 0.2 0.2 0.2 0.2 Tertiary butyl 4 44 4 4 4 4
 Peroxy benzoate ----- (unit section)

[0026] notes 15) "Photomer 5018" (Sannopuko make); weight average molecular weight The

thermoplastic fiberglass-reinforced-plastics ingredient sheet (35% of glass fiber contents) which makes a matrix the polybutyrene terephthalate resin heated to about 300 °C is set to the female mold of the metal mold set as the same 130 °C as the four acrylate radical example 1 per 600; 1 molecule, and it is moulding pressure. It fabricated under 200 kgf/cm² and the conditions for [cycle time] 30 seconds. Subsequently, after canceling moulding pressure, 10ml of said each coat constituent in a mold is poured in between a punch and a moldings, and they are 60 kgf/cm² again. It pressurized and held for 90 seconds. Subsequently, they are an aperture and thickness 100 [about] about metal mold. mum The coat moldings covered with the coat was taken out. About the obtained coat moldings, the same trial as an example 1 was performed, and the result was shown in a table 4.

[0027]

[A table 4]

[Table 4]

----- Fruit ** Example A ratio ** An example -----										4	5	6	7	
8	9	----- Coat appearance Note 9 ** Rank ** Rank ** Rank Rejection												
Rejection **	Rank	Rejection	surface	roughness	Note	10	7.9	10.1	8.1	19.1	18.0	11.3	19.1	Adhesive notes
11	100/100	100/100	100/100	20/100	80/100	90/100	20/100	Warm	water-proof	****	12	100/100		
100/100	100/100	100/15/100	50/100	10/100	10/100	-----								

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CLAIMS

[Claim(s)]

[Claim 1] (i) Vehicle component 100 which consists of the oligomer which has at least two or more acrylate (meta) radicals, its resin or 20 - 70 % of the weight of unsaturated polyester resins, and 80 - 30 % of the weight of copolymerizable ethylene nature partial saturation monomers Coat constituent in a mold with which the chlorination polypropylene 1 whose (ii) chlorine content is 10 - 50 % of the weight - 50 weight sections were made to blend to the weight section.

[Translation done.]